

AMENDMENT UNDER 37 C.F.R. § 1.116
U.S. Appln. No. 09/497,515

REMARKS

Claims 1-20 are all the claims pending in the application. Claims 11-20 are withdrawn from consideration as being drawn to a non-elected invention.

The Amendment filed May 14, 2002 is objected to under 35 U.S.C. § 132 because it allegedly introduces new matter into the disclosure. In particular, the Examiner objects to the subject matter added to page 17, fourth paragraph.

Applicant respectfully submits that the subject matter added to page 17 is not new matter for the following reasons.

First Applicant notes that the only added words to page 17, paragraph 4 are “by solvent extraction method”. The remaining parts of the underlined portion of this paragraph in the May 14 Amendment were inadvertently omitted in the Preliminary Amendment, but were contained in the originally filed disclosure.

In addition, the description of, “As an alternative to this, the solution (c) in which the polymer (a) is dissolved in the solvent (b) is contained by coating or immersion. Then, the non solvent (d) which is insoluble in polymer (a) and soluble in the solvent (b) is substituted for the polymer (a).”, is provided for the explanation on wording of “solvent extraction method” (See page 14, line 23 to page 15, line 4 of applicant’s specification). Therefore, adding the words “by solvent extraction method” does not correspond to new matter.

In view of the foregoing, Applicant respectfully requests the Examiner to withdraw this new matter objection.

Claims 1-7, 9 and 10 are rejected under 35 U.S.C. § 102(b) as being anticipated by Mussell et al. (5,620,807).

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Applicant notes that claim 8 is not addressed in the detailed comments of the rejection. See page 3, of Office action. Therefore, the Examiner is respectfully requested to review this claim on the merits.

Analysis

The Examiner maintains the prior art rejections.

Claim 1 is directed to an electrode for a fuel cell. It includes a catalyst layer and a porous polymer. The catalyst layer contains a solid polymer electrolyte and catalyst particles.

Turning to the Figures, specifically Figs. 4-6, the catalyst layer of the fuel cell has the catalyst particles 41, 51, 62 and solid polymer electrolytes 42, 52, 62 distributed three-dimensionally, and in addition, small pores 43, 53, 63 are provided within the porous polymer itself.

Thus, a solid polymer and a porous polymer are provided in the catalyst layer in Fig. 4. This embodiment illustrates that the porous polymer 44 has a three-dimensional network pore structure existing mainly in the catalyst layer. The small pores 43 are dispersed within the porous polymer 44, which in turn, is dispersed in the catalyst layer.

Mussell, however, does not disclose this physical arrangement. Rather, Mussell discloses a layered structure, wherein the solid polymer 2 is layered as a separate layer from the porous layer 4. More specifically, the catalyst layer 1 includes the discrete layer of polymer 2. A porous layer 4 includes small pore region 6 and a large pore region 7, and does not contain any catalysts (see col. 2, lines 51-53).

pol. layer
cat.

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Thus, in Mussell, the alleged porous polymer is provided at the surface of the catalyst layer 1, but not within the catalyst layer as in the present invention.

In the case of Mussell's patent, polymer and filler such as Vulcan™XC-72 carbon 1 of LI1 or Vulcan XC-72R carbon powder of LI2 in EXAMPLE 1, are mixed to achieve the desired pore structure. (See col. 5, line 55 to 57). Therefore, pores are formed between the polymer and the filler. In contrast, pores of applicant's invention are formed in the polymer itself. (See page 14, line 7 to line 10, and Fig. 10). Introducing the porous polymer, which had numerous pores itself, into the electrode for a fuel cell was not possible until the method of present invention using phase-inversion process was established.

Claim 1 has been amended to clarify that the porous polymer has numerous pores therein. This is clearly distinguishable from Mussell, for the reasons discussed above.

Turning to claim 3, this claim is patentable for the same reasons as claim 1. Namely, the porous polymer has numerous pores therein.

The remaining rejections are directed to the dependent claims. These claims are patentable for at least the same reasons as claims 1 and 3, by virtue of their dependency therefrom.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claims are amended as follows:

1. (Three Times Amended) An electrode for a fuel cell comprising:

a catalyst layer; and

a porous polymer having numerous pores therein,

wherein said catalyst layer contains a solid polymer electrolyte and catalyst particles.

3. (Twice Amended) An electrode for a fuel cell comprising:

a catalyst layer[,];

a gas diffusion layer; and

a porous polymer having numerous pores therein[;],

wherein said catalyst layer contains a solid polymer electrolyte and catalyst particles, and

said gas diffusion layer contains an electro-conductive porous substrate.